

## Appendix C

# Understanding the Analytical Results Plots

For each SMA where storm water samples were collected and analyzed from 2011 through 2019, the analytical results plots have been prepared. The purpose of the analytical plots is to present the analytical results in a manner that allows direct comparison with the TALs as defined in the Individual Permit (ATAL, MTAL, or MQL). In 2019, the plot format changed to include inorganic and organic data for all confirmation monitoring samples collected at the SMA in one plot. The plot contains the results for all analyzed metals, weak acid dissociable cyanide, gross-alpha radioactivity and radium, and organic compounds analyzed in the storm water sample collected at the Site and associated SMA per the requirements set forth in Appendix B of the Permit. Baseline confirmation monitoring samples are represented by a circular symbol in the plot and are referred to as “b”. Initial corrective action confirmation monitoring samples are represented by a triangle symbol in the plot and are referred to as “c1”. Where applicable, subsequent corrective action confirmation monitoring samples at an SMA are represented by a square symbol in the plot and referred to as “c2”. The plots are dynamic, and content will vary based on the amount of analytical data, number of samples collected, and number of monitoring stages at an SMA.

Analytical results for each analyte presented in the plots are normalized by calculating an exceedance ratio. This ratio is defined as the analytical result divided by applicable TAL (ATAL, MTAL, or MQL). Thus, results exceeding the TAL will be greater than an exceedance ratio of 1.0. The exceedance ratios are plotted on a log scale to allow the display of a larger range of values. A solid symbol on the plot represents a result that is detected above the MDL, while a hollow symbol represents a value that is considered a nondetect, meaning the analytical laboratory was not able to detect a concentration greater than the MDL. From 40 CFR Appendix B to Part 136, the MDL is defined as “...the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.”

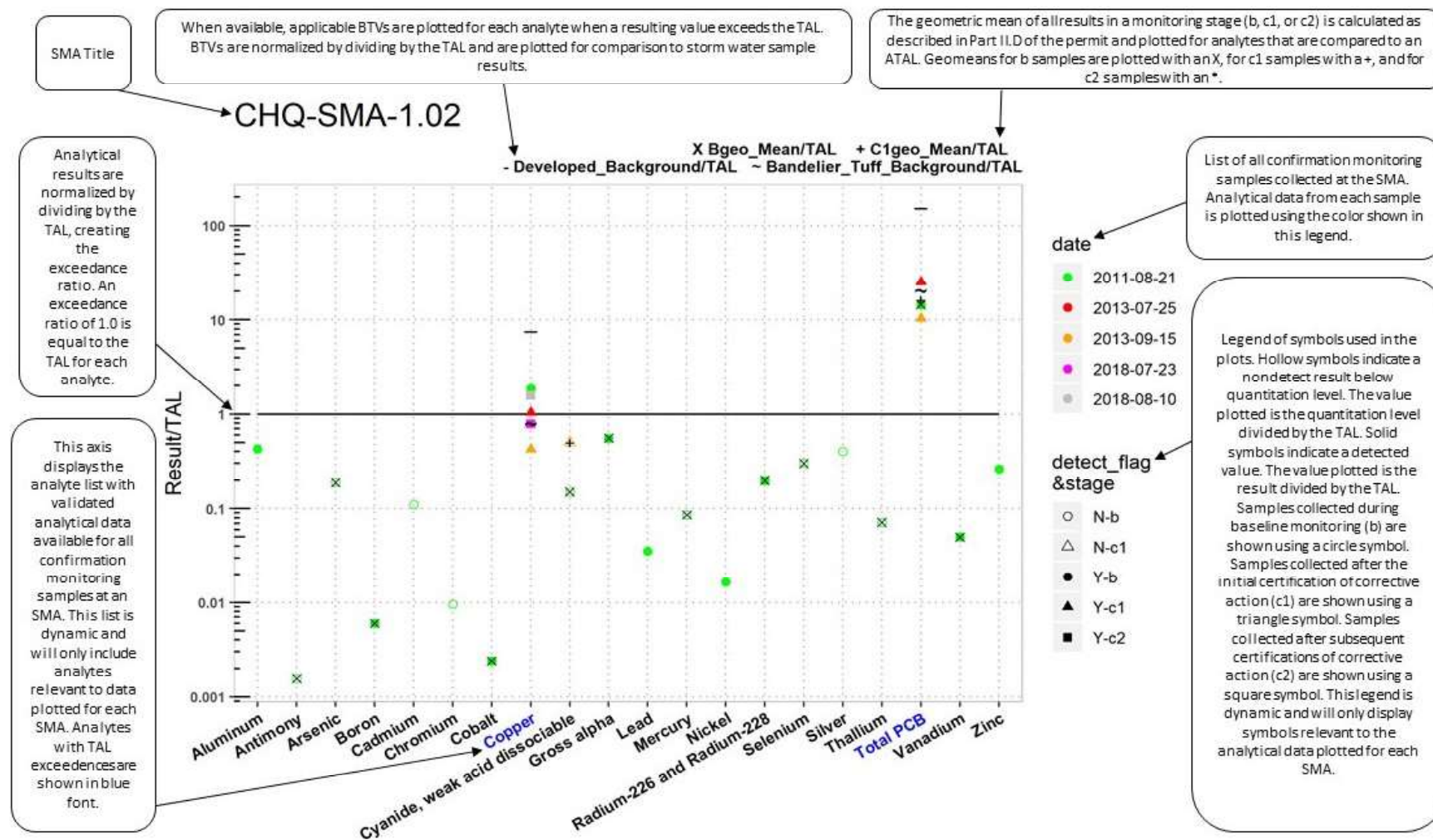
For the storm water data, a nondetected result is either reported as the MDL value or the PQL value. The PQL is an estimation of the concentration measurement and is normally 2.5 to 10 times the MDL. During 2011 to 2014, nondetected analytes were reported at the value of the PQL. When reporting the PQL, the reported value for a nondetected result may be greater than or equal to a TAL (ATAL, MTAL, or MQL). However, starting in 2015, nondetected analytes were reported at the value of the MDL less than the TAL.

Between 2011 and 2014, several nondetected results reported at the PQL for benzo(a)pyrene and hexachlorobenzene were greater than their TALs (MQLs), and the MDLs for these constituents were also greater than their ATALs. In 2015, the Permittees changed the analytical method for benzo(a)pyrene to EPA method 8310. This change allows for the reporting of nondetects of this constituent below the ATAL. In 2015, the Permittees also changed the analytical method for hexachlorobenzene to EPA method 8081B. This method is the most sensitive commercially available EPA-approved method but consistently has an MDL greater than the TAL. These methods were in use by the Permittees starting in 2015.

BTVs in storm water for some metals, gross-alpha radioactivity, and PCBs where available, are also plotted to provide additional points of reference when evaluating the significance of the analytical result. The process for the determination of the BTVs is presented in a report prepared by the Permittees on PCBs in storm water (LANL 2012, 219767) and another report on metals and selected radionuclides in storm water (LANL 2013, 239557).

The following schematic provides more specific details related to individual components of the analytical results plots.

## Appendix C, Understanding the Analytical Results Plots (continued)



## Appendix C, Understanding the Analytical Results Plots (continued)

These rows present the TAL value used in the plot, the applicable MQL, ATAL, and MTAL values and the unit of measure reported for each analyte as established in Part I.C of the Permit.

This is the geometric mean of all baseline monitoring data for the analyte that are compared to an ATAL in the plot.

This is the geometric mean of all corrective action monitoring data for the analyte that are compared to an ATAL in the plot. As applicable, SMAs with subsequent corrective action monitoring data for an analyte will have a row titled C2geo\_mean/ATAL.

Analytical data for each sample date plotted are displayed on two rows. The analytical results are normalized to the TAL and listed here as an exceedance ratio. The top row is the ratio of detected results, with exceedances in bold. The second row is the ratio of nondetected results. NA indicates no analytical results.

This row represents the analyte list with validated analytical data available for confirmation monitoring samples at an SMA and corresponds to the analytes displayed on the plot.

SMA Title  
CHQ-SMA-1.02

	Aluminum	Antimony	Arsenic	Boron	Cadmium	Chromium	Cobalt	Copper	Cyanide, weak acid dissociable	Gross alpha	Lead	Mercury	Nickel	Radium-226 and Radium-228	Selenium	Silver	Thallium	Total PCB	Vanadium	Zinc
TAL	750	640	9	5000	1	210	1000	4.3	10	15	17	0.77	170	30	5	0.5	6.3	0.00064	100	42
MQL	2.5	60	0.5	100	1	10	50	0.5	10	NA	0.5	0.005	0.5	NA	5	0.5	0.5	NA	50	20
ATAL	NA	640	9	5000	NA	NA	1000	NA	10	15	NA	0.77	NA	30	5	NA	6.3	0.00064	100	NA
MTAL	750	NA	340	NA	0.6	210	NA	4.3	22	NA	17	1.4	170	NA	20	0.4	NA	NA	NA	42
unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	pCi/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Bgeo_mean/ATAL	NA	0.0016	0.19	0.006	NA	NA	0.0024	NA	0.15	0.56	NA	0.086	NA	0.2	0.3	NA	0.071	<b>14</b>	0.05	NA
C1geo_mean/ATAL	NA	NA	NA	NA	NA	NA	NA	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	<b>16</b>	NA	NA
2011-08-21 d	0.43	NA	NA	0.006	NA	NA	0.0024	<b>1.9</b>	NA	0.56	0.035	NA	0.016	0.2	NA	NA	NA	<b>14</b>	0.05	0.26
2011-08-21 nd	NA	0.0016	0.19	NA	0.11	0.0095	NA	NA	0.15	NA	NA	0.086	NA	NA	0.3	0.4	0.071	NA	NA	NA
2013-07-25 d	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<b>25</b>	NA	NA
2013-07-25 nd	NA	NA	NA	NA	NA	NA	NA	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2013-09-15 d	NA	NA	NA	NA	NA	NA	NA	0.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	<b>10</b>	NA	NA
2013-09-15 nd	NA	NA	NA	NA	NA	NA	NA	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018-07-23 d	NA	NA	NA	NA	NA	NA	NA	0.79	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018-07-23 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018-08-10 d	NA	NA	NA	NA	NA	NA	NA	<b>1.6</b>	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018-08-10 nd	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Bold font indicate TAL exceedance; d=detected\_result/TAL, nd=nondetected\_result/TAL